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AWARD NUMBER: W81XWH-12-2-0095

TITLE: Multimodal Retrospective and Prospective Unit-Level Analysis of Military Workplace Violence

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REPORT DATE: October 2015

TYPE OF REPORT: Annual

PREPARED FOR: U.S. Army Medical Research and Materiel Command
Fort Detrick, Maryland 21702-5012

DISTRIBUTION STATEMENT: Approved for Public Release; Distribution Unlimited

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REPORT DOCUMENTATION PAGE

Form Approved
OMB No. 0704-0188

1. REPORT DATE *(DD-MM-YYYY)*	**2. REPORT TYPE**	**3. DATES COVERED** *(From - To)*
October 2015	Annual Report	30 Sep 2014 - 29 Sep 2015

4. TITLE AND SUBTITLE
Multimodal Retrospective and Prospective Unit-Level Analysis of Military Workplace Violence

5a. CONTRACT NUMBER

5b. GRANT NUMBER
W81XWH-12-2-0095

5c. PROGRAM ELEMENT NUMBER

6. AUTHOR(S)
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5d. PROJECT NUMBER

5e. TASK NUMBER

5f. WORK UNIT NUMBER

7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES)

RTI International
3040 Cornwallis Road
Research Triangle Park, NC
27709

8. PERFORMING ORGANIZATION REPORT NUMBER

9. SPONSORING / MONITORING AGENCY NAME(S) AND ADDRESS(ES)
U.S. Army Medical Research and Materiel Command,
Fort Detrick, Maryland 21702-5012

10. SPONSOR/MONITOR'S ACRONYM(S)

11. SPONSOR/MONITOR'S REPORT NUMBER(S)

12. DISTRIBUTION / AVAILABILITY STATEMENT

Approved for Public Release; Distribution Unlimited

13. SUPPLEMENTARY NOTES

14. ABSTRACT
Work focused on acquiring, processing, and analyzing multiple data sets for the retrospective study that will test hypotheses generated from the socio-ecological framework of the factors correlated with violence perpetration by active duty soldiers and marines. Multiple data sets including information on approximately 1.9 million soldiers and marines who were on active duty between 2000 and 2012 were acquired and processed; the data acquisition for the retrospective study is complete except for one dataset from the Army containing crime information for which we continue to submit requests. For the prospective study, two instruments (one for enlisted personnel, the other for leadership) were developed and tested in house; a protocol for pilot testing the instrument with veterans is being negotiated with RTI's IRB. IRB approval from RTI's IRB for fielding the prospective study (two waves of data collection at six military installations) is pending a small revision; once approval is received materials will be submitted to the NHRC IRB and HARPO. In addition, Health Risk Behavior survey data were obtained and analyzed to test hypotheses about risk and protective factors and criminal and risk taking behavior; a manuscript was drafted and will be submitted to a peer-reviewed journal early next year. A poster providing information on the study was presented at the 2014 Military Health Services Research Symposium.

15. SUBJECT TERMS
Military workplace violence

16. SECURITY CLASSIFICATION OF:			**17. LIMITATION OF ABSTRACT**	**18. NUMBER OF PAGES**	**19a. NAME OF RESPONSIBLE PERSON**
a. REPORT	**b. ABSTRACT**	**c. THIS PAGE**			USAMRMC
U	U	U	U	10	**19b. TELEPHONE NUMBER** *(include area code)*

Standard Form 298 (Rev. 8-98)
Prescribed by ANSI Std. Z39.18

Contents

1. INTRODUCTION

More than a decade of war characterized by multiple deployments and intense combat exposure has increased concerns about US service members' behavioral health, risk-taking behaviors, disciplinary and criminal actions, and targeted acts of violence including homicide. The Multimodal Retrospective and Prospective Study of Military Workplace Violence (MWV) is using complementary retrospective and prospective studies to identify static and dynamic predictors of targeted violence in the US military workplace. The research will identify factors that increase and mitigate risk of military workplace violence (MWV) at individual, unit and installation levels to inform prevention and interventions and will offer concrete recommendations to reduce risk and increase protective factors. The research, being conducted by RTI International in cooperation with the Naval Health Research Center (NHRC), is addressing the following research hypotheses:

1. Deployment characteristics, including number of deployments and combat intensity, will increase MWV;
2. Disciplinary infractions, minor crimes, PTSD and other mental problems, and substance abuse will increase MWV;
3. Treatment and social support will mediate the relationships among deployment characteristics, intervening outcomes, and MWV; and
4. Individual and family/peer risk and protective factors and training will moderate the relationships between deployment, intervening outcomes, and MWV.

The retrospective study entails the acquisition and analysis of administrative data for soldiers and marines who were on active-duty between 2001 and 2012 from multiple sources that will be combined and analyzed to test the research hypotheses. The prospective study will entail two rounds of anonymous surveys with members of randomly selected companies at four United States Army Bases (Fort Bragg, Fort Carson, Fort Hood, and Joint Base Lewis McCord) and two United States Marine Corps installations (Camp Lejeune and Camp Pendleton).

2. KEYWORDS

Military
Workplace Violence
Combat
Deployment
Traumatic Brain Injury
Post-Traumatic Stress Disorder
Risk Taking Behaviors
Risk Factors
Protective Factors
Social Support
Mental Health
Substance Abuse

3. OVERALL PROJECT SUMMARY

The Multimodal Retrospective and Prospective Study of Military Workplace Violence (MWV) is using complementary retrospective and prospective studies to identify static and dynamic predictors of targeted violence in the US military workplace. The conceptual model shows a framework within which ***risk and protective factors*** lead to targeted ***MWV*** directly and indirectly through ***intervening outcomes*** that in turn also may lead to and, thus, serve as potential predictors of MWV. These intervening outcomes include PTSD and other mental health issues, substance abuse, disciplinary infractions, and criminal acts. These linkages may be ***mediated*** by preventive efforts (e.g., predeployment stress inoculation training for primary prevention of combat-related stress disorders) and by timely and appropriate intervention including substance abuse and mental health treatment, as well as support in theater and upon reentry. The effects of deployment may be ***moderated*** by individual characteristics, as well as by military training and support. The overall study design is shown in Figure 2.

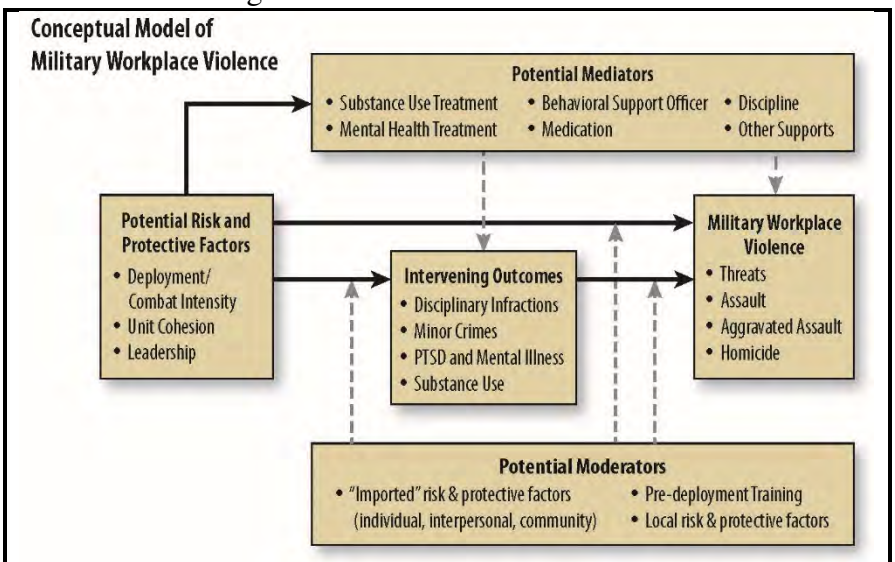

Figure 1. Conceptual model of Military Workplace Violence.

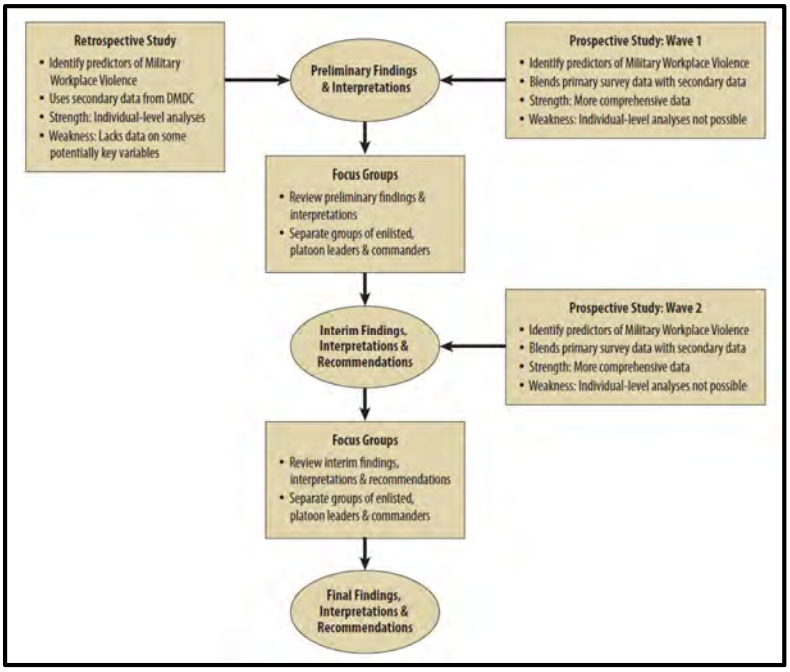

Figure 2. Study Design

3.1 Retrospective Unit-Level Analysis of Military Workplace Violence

The goal of the Retrospective Study is to develop and analyze unit-level measures to test the overarching research hypotheses identified above. Specifically, the goal is to establish a unit of observation equal to a UIC-quarter. The UIC quarter measures will summarize or reflect the occurrence of the event or incident of interest within the UIC during a specified quarter. For example, we have created a variable that summarizes the total number of days individuals assigned to each UIC were deployed during each quarter in our study period (2001-2012).

During Year 3 of the research, we continued to make progress on the assembly and processing of multiple administrative datasets for all individuals on active duty in the US Army or US Marine Corps between January 2001 and December 2012 (1,936,524 individuals). These data were obtained by Dr. Valerie Stander of the Naval Health Research Center, deidentified, encrypted, labeled with study identifiers, and securely transmitted to RTI for processing. The following data were obtained:

- CHAMPS inpatient and outpatient diagnosis and treatment data
- Accession and discharge data
- UIC assignment (transfer) data
- PDHA and PDHRA data
- DIBRS data
- Drug testing, screening, and treatment data
- COPS data for the USMC (still working to obtain US Army COPS data)

During Year 2, a coding schema developed for the ICD-9 CHAMPS data was successfully applied to both the inpatient and outpatient diagnosis data. Note that although we have some data through December 2012, the amount of data begins to decline substantially through 2011 and 2012, due to lags in the acquisition of CHAMPS data at NHRC. Therefore, during Year 3, although we continue to process all of the data we have, we made the decision to only use the data for the 40 quarters between January 1, 2001 and December 31, 2010. We also determined that the medical data do not include diagnoses and treatments incurred during battlefield deployment; after multiple inquiries, Dr. Stander determined that colleagues at NHRC are currently compiling these data at NHRC and she executed an agreement to obtain the data as soon as they are available.

Programming was developed to assign diagnoses and treatment from the CHAMPS inpatient and outpatient data files to person-days which were then cumulated into person-quarters and UIC-quarters. The person-quarter variables indicate, for example, the number of outpatient visits an individual made during a specific quarter in which s/he received an anxiety diagnosis. The UIC-quarter variables indicate, for example, the total number of outpatient visits with an anxiety diagnosis by all individuals assigned to the UIC during that quarter. As individuals move between UICs during quarters, we calculated UIC-quarter rates to control for the total number of days individuals were assigned to each UIC during each quarter.

In addition to these variables, we calculated a number of other variables at the person-quarter and UIC-quarter level. Person-quarter level variables include the static measure gender as well as the following:

- Age
- Married/Formerly Married/Single indicators

- Officer/Enlisted indicator
- Length of service (in days)
- Cumulative number of deployments
- Cumulative deployment rate (days deployed/length of service)
- Proportion of quarter that an individual was not deployed (as a control measure)
- Cumulative exposure to non-battle deaths (of members of the person's UIC)
- Cumulative exposure to battle deaths (of members of the person's UIC)

UIC-quarter level measures include the following:

- Cumulative deployment rate (total days deployed by individuals in a UIC during a quarter/total length of service of those individuals)
- Cumulative diagnosis rates through previous quarter for outcome variables (e.g., anxiety diagnosis visits)
- Cumulative non-battle deaths for the UIC
- Cumulative battle deaths for the UIC

We examined the data graphically. Figure 3 shows the average person-level cumulative deployment (for all service members) and average percentage of persons receiving a diagnosis for anxiety, depression, substance abuse, or alcohol over the study period.

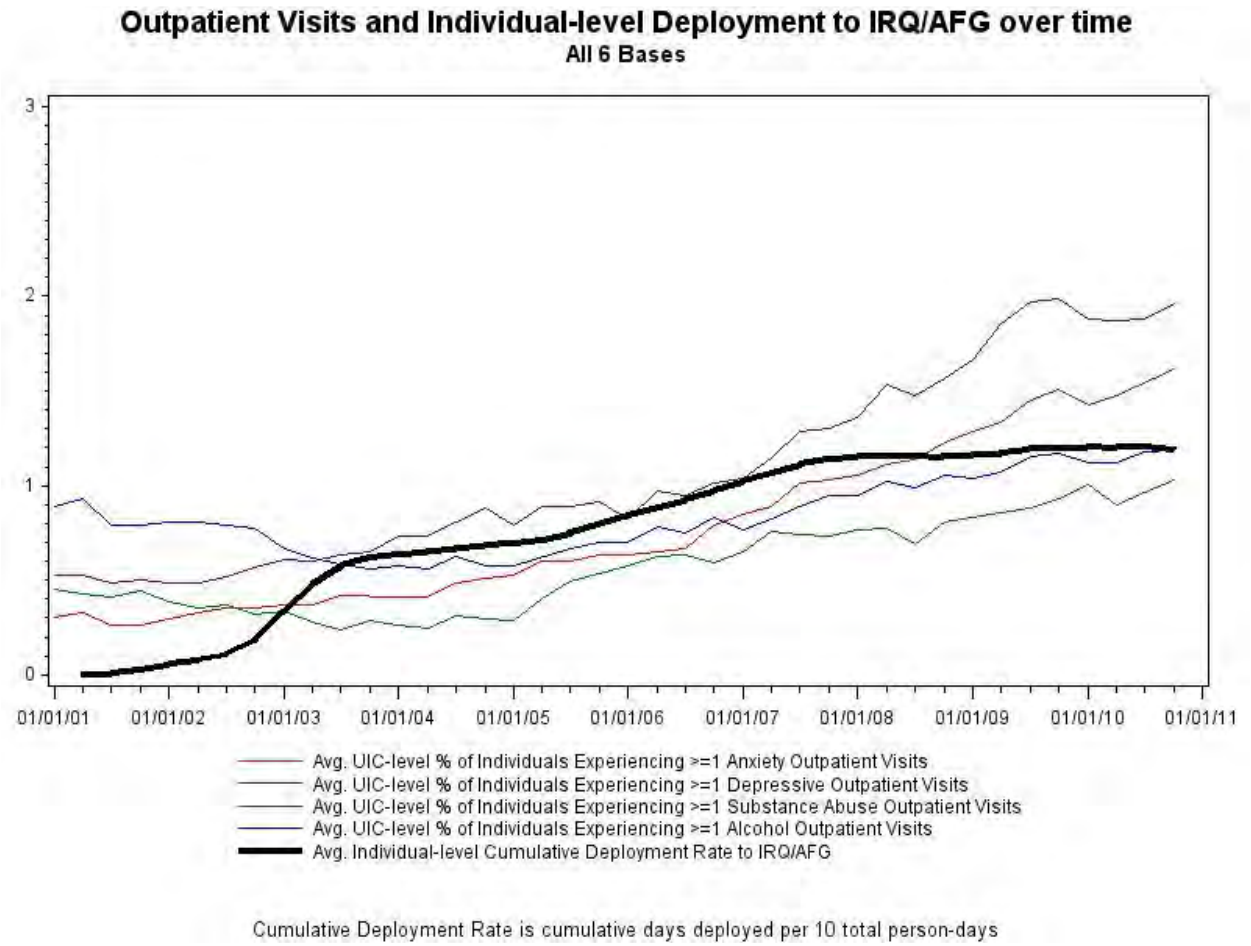

Figure 3. Deployment and diagnosis rates for four behavioral health indicators.

We spent a considerable amount of effort configuring the data to the installation level—specifically, the six installations that are planned for the prospective study. UICs were eventually assigned to installations using zip code information.

We began to estimate models using the data, stratified on installation or base. These preliminary models are testing hypotheses generated on the left-hand side of our logic model (Figure 1). The unit of observation is the person-quarter. (See Table 1.)

Table 1. Numbers of persons, person-quarters, and persons with at least one anxiety-visit quarter

Installation	Persons	Person-Quarters	Persons with >= 1 Anxiety Visit- Quarter
Bragg	171,165	2,137,731	8,398
Carson	88,026	854,957	7,566
Hood	199,422	2,275,090	13,340
McChord	107,376	1,173,442	7,332
Lejeune	221,893	1,670,167	4,581
Pendleton	215,013	1,745,489	4,894

The models are examining the relationships among the behavioral health outcomes and deployment, mediating and moderating variables. Models are being estimated for each installation, with individuals nested within UICs (random effects). An autoregressive error structure has been imposed on the models. Because of the numbers of observations the models take a considerable period to converge even on RTI's Linux cluster of servers—several days for models including all person-quarters for an installation. As a result, we are testing preliminary models by excluding the autoregressive error structure, as results on models run to date are similar between those including and excluding the autoregressive error.

Work has begun on a journal manuscript that examines the relationship of deployment to anxiety diagnoses. Other manuscripts that examine the relationship of deployment to depressive disorders and substance use are planned.

A manuscript "Psychological Model of Military Criminal and Aggressive Behavior: Findings from Population-Based Surveys" describing findings from an analysis of the Health Risk Behavior survey data from 2005 and 2008 was prepared and submitted to *Psychology of Violence.*

We requested and received from DMDC quarterly UIC snapshots showing personnel by pay grade and gender for all active duty UICs during that quarter from 2001 to 2014. These data will be used to provide context information for the UIC-quarter measures we are developing. In addition, we are conferring with these data as we finalize sampling strategies for the prospective study.

Results summarizing work to date was presented at the MOMRP Violence IPR at Ft. Detrick, Maryland, 15 October 2015.

3.2 Prospective Analysis of Military Workplace Violence

Work continued on activities for the prospective study.

1. A draft of the instrument was developed that incorporates both questions for all personnel and a separate section for leaders. (This version combined the two instruments developed and tested internally last year: One for enlisted personnel and one for leaders.) Work continued throughout the year to shorten the instrument—with a target of assuring that administration would take no more than an hour.
2. RTI IRB and HRPO approval were obtained to conduct cognitive and pilot testing of the draft instrument.
3. The study team tested several tablets and two software systems to identify a satisfactory combination for fielding the instrument, which covers multiple domains incorporating numerous skip patterns. Tablets were purchased; review of the instrument by a survey methodologist; and programming of the instrument began during Year 3.
4. Cognitive testing of the instrument in which military veterans reviewed the questionnaire and commented on the understandability, appropriateness, and likelihood that an individual could easily respond to the questions was conducted. As the instrument contains multiple questions that could cause individual discomfort, those participating in the cognitive interviews were also asked about the degree to which they felt individuals would be comfortable responding to the questions in a group format.
5. An IRB package describing the protocol for implementation of the prospective study was submitted to RTI's IRB; the review is scheduled for November 2, 2015.
6. A Human Subjects Research Protocol package describing the protocol for prospective study implementation has been drafted and will be submitted to the US Army Medical Research and Material Command Office of Research Protections once RTI IRB approval is received.
7. Preliminary outreach to the six bases where we have proposed to conduct surveys continued. We plan to increase our outreach efforts during the first quarter of Year 3 with a goal of conducting Wave 1 interviews in the Spring/early Summer 2016.

4. KEY RESEARCH ACCOMPLISHMENTS

Models testing hypotheses generated from the left-hand-side of the theoretical model have been successfully estimated and results are being written.

5. CONCLUSION

During Year 4, we plan to continue to analyze the retrospective data and prepare at least five manuscripts. We also plan to field the first wave of the prospective survey and to begin data analysis and reporting.

6. PUBLICATIONS, ABSTRACTS, AND PRESENTATIONS

a. List all manuscripts submitted for publication during the period covered by this report resulting from this project.

A manuscript "Psychological Model of Military Criminal and Aggressive Behavior: Findings from Population-Based Surveys" describing findings from an analysis of the Health Risk Behavior survey data from 2005 and 2008 was prepared and submitted to *Psychology of Violence.*

b. List presentations made during the last year (international, national, local societies, military meetings, etc.).
    a. Program review presentation at Fort Detrick, MD, October 15, 2015

7. INVENTIONS, PATENTS AND LICENSES

Nothing to report.

8. REPORTABLE OUTCOMES

Nothing to report.

9. OTHER ACHIEVEMENTS

Nothing to report.

10. REFERENCES

Nothing to report.

APPENDICES

None.